TWG Comments on Strategic Plan Document
Received at December 7 and 8, 2000 Meeting and Afterwards
With Responses from the Ad Hoc Committee on Strategic Planning

#	TWG Comment/Small Group Recommendation	Ad Hoc Committee (AHC) Response
	PRINCIPLES/GENERAL COMMENTS	
1	In the overall principles section, I feel like number 8/9 is lacking a little something. It currently states: Recognizing the diverse perspectives and spiritual values of the stakeholders, the unique aesthetic value of the Grand Canyon will be respected and enhanced. I'd suggest adding something to this sentence indicating how we plan to respect and enhance, something like... Recognizing the diverse perspectives and spiritual values of the stakeholders, the unique aesthetic value of the Grand Canyon will be respected and enhanced through on-going consultation with all interested parties and careful integration of the results of research and monitoring into management decisions....	The AHC members felt that the comments, if incorporated, would change the principle into a Management Objective, although they agree with the requirements for consultation and integration. They felt those requirements are covered in the MOs under Goal 11, the cultural resources goal.
2	Many of the MOs ask to "maintain" or "attain" a target level that represents the new ecosystem paradigm since Glen Canyon Dam was constructed. This seems to be in direct conflict with Principle 6 that says we are trying to "return ecosystem patterns and processes to their range of natural variability." Natural variability would seem to mean variability devoid of man's influence and since that is not the case downstream of the dam, we think it more practical to support MOs that recognize the new paradigm. As Bob Winfree stated at the last TWG meeting and we paraphrase, there is value in maintaining the NHWZ and marsh vegetation (the new ecosystem paradigm) but we should attempt to preserve native vegetation types whenever possible.	1. The AHC does not place emphasis on the directional statement in the "action" column, and urges readers to do the same. Look instead to the current and target levels to determine the direction – "maintain" refers to maintaining the target level. The AHC may reword or drop the action word when the targets are completed. 2. The AHC continues to support Principle 6. This principle and Principle 2 explicitly recognize the continued existence of the dam and the AHC does, too. The MOs affirm this recognition. 3. The AHC concurs with the last sentence of this comment, with the emphasis on preserving native vegetation types as noted in the Vision/Mission statement.
3	Our choices are limited by GCPA and other documents.	Concur.
	FOODBASE	
4	The targets are vulnerable to being wrong because conditions change under different flow regimes.	We expect conditions to change due to the dynamic nature of the ecosystem. Thus, the targets will be ranges or thresholds. Principle 8 (on how AMWG will address unattainable goals) will also guide our work in this area.
5	It's unclear whether the sampling sites are representative of the river as a whole.	This will be addressed by the aquatic foodbase Protocol Evaluation Panel (PEP).
6	We don't know if 1996-97 are the correct targets - needs explanatory targets. MO 1.1- 5: 1996 and 1997 are used to develop target	That year was used because the data suggest that 1996-97 shows the highest foodbase numbers seen, and no species were known to be food-limited at that level.

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	values for these MOs. These years were unusual in both, quantity of water and management activities. It seems sensible to base targets on the "norm" of ROD operations rather than unusual and experimental circumstances for which current levels and repeat data are not available. However, this is a general comment as I am not familiar with the data.	However, this deserves further exploration to determine if this target level is needed to achieve this goal.
7	Foodbase MOs: The quantitative target for each of the MOs must recognize the following: 1. Targets are very vulnerable to being wrong due to extreme variability; 2. Targets should be set for specific sampling sites, times and methods; 3. Targets for all sites should not be lumped or averaged to attempt a measure of the river as a whole as we do not know how representative the sample sites are of river production; and 4. Targets are affected by flows and other factors as evidenced by the exaggerated production in Lees Ferry reach under 2000 steady flows but downstream areas dropped off as turbidity increased in late summer.	1. and 4. We expect conditions to change due to the dynamic nature of the ecosystem. Thus, the targets will be ranges or thresholds. Principle 8 (on how AMWG will address unattainable goals) will also guide our work in this area. 2. and 3. These issues will be addressed by the aquatic foodbase Protocol Evaluation Panel (PEP).
8	The target levels shown for 1.1 Primary Producers from the Dam to the Paria River are an average of the 16+ miles of river and over a two-year period, broken down only by cobble or pool. Although the ranges given seem relatively small, we reiterate our four concerns listed above. This pattern is repeated under 1.2. <u>The pattern under 1.3 (downstream of Paria) is better</u> in that specific river miles and bottom type are used as the sites for targets. This pattern should be used in 1.1 and 1.2.	The data for these target levels is based on what we have now, which is from one sampling site for biomass and three for composition. This will be addressed by the PEP.
9	The target levels for 1.4 Benthic Invertebrates below Paria River also is not as acceptable as the pattern under 1.3 in that it is not sensitive to the variance by station down the river. It merely lumps all data for benthic invertebrates for cobble and pool for 260+ miles of river. We suggest using actual data for the benthic invertebrates at the same river miles shown for primary producers.	Good comment. See response under #8, above.
10	MO 1.1 Target for algal biomass is 7.5 times the current level shown. Is this desirable or attainable?	The "current level" data are being evaluated, and in the latest version of the document, the numbers have been removed. NAU and AGFD have different sampling designs and thus, different results.
11	Why are just cobbles and pools included, and not backwaters, etc.?	Shannon sampled these areas because he felt these were the important ones. Backwaters have not been consistently sampled. The PEP will review this.
	NATIVE FISH	
12	Consistency w/ Upper Basin recovery goals is important.	Concur. Issue Paper E clarifies that our goals and recovery goals should be consistent, but not necessarily identical.
12a	MO 2.1: Foot note 1 - I believe recent efforts (LCR) have pit-tagged HBC down to 100 mm and the new	This will be addressed by the PEP.

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	protocol for stock assessment is adopting some minimum size smaller than 150 mm.	
12b	MO 2.1: Target level, etc. – Investigations indicate the LCR HBC population is healthy and stable over the period of our investigations. It seems logical the current level of 4330-4811 HBC from Marsh and Douglas makes a good target level, as well. I understand there is discussion about possible meta-population viability analyses, but in separating the LCR from the mainstem, the evaluation becomes a mainstem MO. We are not likely to increase habitat, foodbase, flows, temperature, or other attributes of the LCR related to local humpback chub abundance with dam operations. It makes sense to me to make the current level the target. Maintenance of this level is the MO.	The target is viability. GCMRC is evaluating the historic data and the stock assessment people aren't prepared to establish a numerical target at this time, so it will remain as an IN.
12c	MO 2.1: Regarding the Comment column, will results of the new protocols for population estimates (2000) be incorporated into the target level over time, dropping the 1991-96 estimates?	All data will be used, including the most current as well as the 1991-96 data.
12d	MO 2.2 Question: does the same size class used for the LCR (51-150 mm) hold true for the mainstem in light of the temperature difference and probable retarded growth rate?	The appropriate size classes will be based on available data. If the size class is different, this will be addressed.
12e	MO 2.2 and 2.3: It is important to know annual year class strength (spawning success) and recruitment, but in the LCR these are targets we have no control over with dam operations. I suggest that targets could be set for mainstem aggregation MOs responding to changes in dam operations, but within the LCR this is just an important monitoring effort and not a MO with targets we can attain or maintain. For the LCR these two MOs can be removed (suggested) or the action taken changed from "maintain or attain" to "monitor." I want to be careful we do not create MOs and set targets for attributes we do not have control to achieve.	1. Scientists believe that dam operations will impact the LCR aggregation. For example, ponding at the mouth of the LCR. 2. These MOs aren't only for conditions that dam operations can affect. They are what it will take to achieve the goal.
13	MO 2.3: Definition of spawning aggregation from B.O. (HBC)	The definition of the LCR aggregation will be resolved following completion of the stock assessment workshop and the PEP review. The BO was not helpful in constructing this definition.
13a	MO 2.4: To make this MO consistent with the BO it should read similar to: Maintain or improve; HBC; Spawning Habitat; Mainstem or other tributaries; Uncertain Spawning Level; One Additional Spawning Aggregation;	This has been changed to be consistent with the BO, per BOR.
13b	MO 2.4: Comment - CPUE of specific size class would be the indicator of spawning success as in MO 2.2.	The PEP will address this issue.
13c	MO 2.5: Disease and other parasites – Tim Hoffnagle's recent and past work may shed some light on the background level of disease and parasitism in HBC.	No response needed.
14	2 alternatives for 2.6	The AHC chose the second alternative.

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14a	MO 2.6: Target Level – Rewrite: "Needs to be defined as the level above which the predation rate may/will (?) negatively affect **removal of jeopardy from** native fish**.**" Some predation will always occur which is inherently negative to native fish at any level.	After discussion, the AHC decided to maintain its target of viability.
15	Using CPUE as the target is not desirable. We support actual abundance estimates (mark recapture) over an index of relative abundance. Recent work by USFWS's Coggins supports earlier work by Marsh and Douglas in deriving a fairly good population estimate of Humpback chub and these should be used in lieu of CPUE values.	This issue will be referred to the PEP.
16	2.4: We remain concerned that the level considered to be a viable population for HBC for this program differs from the level considered viable and being proposed as recovery goals by the USFWS. The target level should be derived by a jointly acceptable method to avoid conflicting targets and ESA difficulties when it comes time for down- or delisting. Also, we assume the population levels identified by the USFWS in the Biological Opinion are needed to remove jeopardy and not to achieve viability. Each of these needs to be identified in the target level column. If additional target levels to achieve viability are known, they should be separately identified and put in the target levels column. If not, these should be identified as information needs.	Issue Paper E clarifies that our goals and recovery goals should be consistent, but not necessarily identical. If the target for viable populations and the target to remove jeopardy are different, the AHC agrees that they will be divided into separate MOs. The AHC also concurs that the target level should be derived by a jointly acceptable method.
16a	MO 2.7: This MO will, in my opinion, be unattainable as written, regardless of the target level set. The CRE below GCD is not likely to ever support "populations" of RBS due to lack of suitable habitat (flooded bottomlands). Two suggestions to be consistent with the BO: 1. Convert this to a habitat objective under "Riparian" with habitat development targets at specific locations (Lees Ferry and inflow to Lake Mead - from the BO, or Cardenas or Havasu creeks – personal comm. with D. Kubly). Individuals (maybe aggregations) will come or not, but populations are not likely to develop. 2. Rewrite the MO similar to: Attain; RBS; Presence or Occurrence; Inflow to Lake Mead; 0 (since 1991); Post-dam average frequency of capture or two captures per 5 years (?); Target is related to the capability of the habitat to attract and support the species. Note that the BO only states "Develop actions that will help ensure the continued existence of the razorback sucker…." It does not say attain populations at specific target levels. This in concert with the very limited habitat suitability makes the conversion or rewrite of the MO a logical step to create a reasonably attainable objective.	The AHC changed the attribute from "Populations" to "Abundance," and changed the qualitative target to: "Target is <u>derived from the</u> capability of the habitat to support the species. The AMWG added, ", and includes the removal of jeopardy."

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17	2.6 - How is predation measured?	An estimate is made of mortality by measuring abundance and distribution of native and non-native fish, and the results of a stomach content analysis. These results are then compared to other sources of mortality to determine predation.
	TROUT	
18	4.1: Don't know if 250,000 is the correct upper limit (leakage, health).	The target in the past was 100,000 Age II+ trout. The target should not attain or exceed the level at which trout impinge on the viability of native fish. The AHC agreed to keep the target at 100,000 Age II+ individuals until research demonstrates that a higher number will not impinge on native fish.
19	MO 4.2 sets a target of 100% natural recruitment. This may be desirable but is not a target under the control of dam operations or the Adaptive Management Program (AMP). This is solely determined by Arizona Game and Fish Department policies regarding their choice to stock or not to stock rainbow trout. If the trout population crashes, the AGFD may opt to resume stocking to maintain catch rates.	Dam operations do affect natural recruitment. However, the AHC agrees with the statement on AGFD policies.
19a	MO 4.2: Current Level – As an indicator → Current population estimate of RBT (and should include BRT) at the mouth of the LCR reach, + or – 3 miles. Target Level – As an indicator → Reduction of these population estimates to 5% (?) of current level. This will relate directly to attainment of MO 2.6.	How predation will be measured hasn't been developed yet. These comments will be considered when the metric is developed.
20	Electrofishing is for Lees Ferry only.	The AHC did not completely understand this comment. GCMRC uses electrofishing throughout the CRE. The PEP has validated this method. However, the AHC removed the electrofishing CPUE attribute from the MO.
	KANAB AMBERSNAIL	
21	5.1 Monitoring current KAS populations at Keyhole, Elves, and Deer Creek is appropriate. Populations should not be expanded through relocation to other areas.	Concur.
22	5.2 The Kanab Ambersnail MO to maintain habitat at Vasey's Paradise should not include maintenance of habitat elsewhere for translocated snails. These snails have been introduced on an experimental basis for an indefinite period. We have no idea what potential numbers may occur in the new areas nor what value they may represent to the genetic diversity of the Vasey's population.	MO 5.2 does not include habitat outside Vaseys Paradise.
22a	ID # (old 25) Current Level: The place is "Above 125,000 cfs stage level," yet Current Level mentions "area below 70,000 cfs stage." I am not sure what this means with regard to the target level above 125,000 cfs.	The revised place is "Vasey's" and the current level is an IN.
23	MO 25: Why is this changed to "do not impact?"	"Do not impact" was meant to be a clarification. This was changed back to "maintain." Emphasis should be on the

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		current and target levels, not on the action word.
24	MO 25 - "current" level is at < 70K, while stage level is not 70K.	Current level data reflect the data we have. Data for the correct stage level is an IN.
25	MO 25: Amended to read "Maintain KAS habitat above some stage level at Vasey's Paradise (stage level is an IN), current level is an IN, target level is a ten-year running average greater than or equal to 50% of the total area of occupied habitat measured at Vasey's in March 1996, with a minimal level TBD (IN). Comment: Target is level needed to sustain a viable population. Purpose is to limit human impact, by intentional flooding or other actions, to habitats occupied by KAS.	The AHC recommends that a population viability analysis be added as an Information Need. In the next version of the Strategic Plan, the target level may change based on the analysis. The AHC made further changes to this MO.
26	Two new MOs to be drafted by Bob Winfree on other KAS habitat (to augment MO 25). No consensus was reached at the TWG meeting, but the following was discussed: ▪ It could be a separate MO or simply be monitored. ▪ "Do not impact spring and wetland habitat occupied by KAS in Keyhole, Deer Creek, Elves Chasm/IN/IN." ▪ Comment: to prevent human impact . . . ▪ Gives us more flexibility in the AMP ▪ high-use recreation areas ▪ outside CRE ▪ possible consultation issue ▪ Expert Panel doesn't support ▪ ESA/translocation important	No additional MOs are needed. See management action to monitor KAS populations in MO 5.1.
	SOUTHWESTERN WILLOW FLYCATCHER	
27	MO 6.6 Tying Southwest Willow Flycatcher targets to habitat rather than numbers is the right approach.	Concur.
27a	ID # (old 27): How will this MO mesh or conflict with Lake Mead water regulation requirements? The concern is Lake Mead management is outside the scope of the AMP.	The reference to Lake Mead has been removed.
28	MO 27: Lake levels are outside our control. Consensus during TWG meeting: "Lake Mead water levels are an important factor, <u>but are outside the control of the AMP</u>."	The AHC removed this comment from the document because the vision/mission statement adequately describes our legal responsibilities.
29	Goal 8 (SWWF) was deleted, and MO 27 moved to the riparian goal.	This was done.
30	Maintenance of habitat for Southwest Willow Flycatcher, especially from Separation Rapids to Lake Mead (area of reservoir influence), is problematic as this habitat is affected by reservoir levels. During drought periods, levels drop and plants may die but this must be recognized as a necessary feature of the system we have, just like the presence of Glen Canyon Dam. Lake Mead water levels are outside the control of the AMP.	The "At Some Place" column was changed to "CRE below GCD~~, and especially from Separation to Lake Mead.~~" This was done for consistency, in recognition of legal realities, and in recognition of the AMP boundary at the Grand Canyon NP boundary.
	RIPARIAN AND SPRING COMMUNITIES	
31	How often would marshes be measured?	GCMRC and the PEP will determine this.

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32	New MO for the riparian goal: Maintain spring/wetland habitat occupied by rare and endemic species at (some stage level) in CRE below GCD (IN) (IN)	This was added.
33	MO 29: Are we counting non-native vegetation as a percentage of total in any given measurement or monitoring, or of a 10-year average?	This is TBD.
34	MO 29 probably needs to use a different year than 2000 as a baseline for a target owing to the unusual flow conditions. It has not been established that ± 50% of the area defined by aerial photography in 2000 is the appropriate one we should be using to set the 10-year running average. We should pick a year under ROD flows.	The year 2000 was picked because of the intensive remote sensing during that year; we need to use a year when data are available. The AHC changed "10-year running average" to "x-year running average" and "50%" to "y%."
34a	ID # 30, Abundance, Target: I am wondering if this is a reasonable target without some qualifiers due to the probabilities of future BHBFs and HMFs. At 45 kcfs, let alone the possibilities of 60 or 90 kcfs, the NHWZ will be impacted. Perhaps there was discussion on this point that I missed. I would be more comfortable if somewhere there was a qualifier stating that impacts to the NHWZ from prescribed, experimental, or natural high flows are acceptable losses. I don't want to set objectives for goals that we may immediately violate.	The revised target is an IN that allows for some scouring with return through succession.
35	MO 30: The target is an IN.	Concur.
36	MO 30: Should abundance be distribution and area, abundance?	Abundance was changed to "patch number and distribution."
37	MO 30 needs to define "Abundance" in terms of number of areas or square meters or ? Also, using 2000 as the baseline year for the target is problematic. The aerial photography done in 2000 represents abnormal riparian growth as the zone below the NHWZ typically devoid of riparian vegetation under ROD flows (25,000 cfs level) was invaded by plants. Growth in this zone (between 8,000 and 25,000 cfs) should be subtracted from the total NHWZ abundance figures.	The baseline year for Patch Number and Distribution is now 1984.
38	MO 30: should the element be NHWZ vegetation?	The AHC changed the element to "NHWZ community," which includes plants and animals.
39	MO 30: Target metric could be # of miles/reach +/- x, or # of patches/reach +/- x	The metric is now undefined and part of the IN.
40	MO 30: How does one distinguish between NHWZ and sand beaches?	NHWZ is more stable and more woody, but the two are essentially the same place. See glossary for definition of NHWZ. (To be done by Rick.)
40a	ID #31, Abundance, composition, distribution, Target: I am not sure this is a target we can achieve. To my understanding the OHWZ was supported by the old high water flow stages. Those no longer occur under ROD flows. It is not logical that current operations, even with BHBFs of larger magnitude, will support the OHWZ vegetation as it exists in 2000. It is a diminishing resource by virtue of lower maximum flow stage that we cannot manage with ROD operations. Let me know if I am confused on this somewhere.	The revised target is an Information Need. See Principle 8: "If the target of a management objective proves to be inappropriate, unrealistic, or unattainable, the AMP will reevaluate that target and the methods used to attain it." There is disagreement among experts as to whether this is a diminishing resource.

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41	The target under MO 31 for the Old High Water Zone is unrealistic as there is nothing dam operations can do to help or harm this vegetation. This zone was originally defined in the EIS as occurring above the old scour zone at about the 123,000 cfs level. Short of emergency use of the spillways, this level is far above any flows considered within the operating range of the dam. For these reasons, we think having a target for OHWZ vegetation puts unrealistic expectations on dam operations and therefore should be deleted.	The focus should be on maintaining the OHWZ community at some stage to be determined. Flows of 123,000 cfs are within the operational flexibility of the dam.
42	MO 32: Sand beach MO is problematic: ▪ there is a competing MO under the recreation goal and if we can accomplish it in one MO we should, ▪ the small group couldn't develop a target for the MO, ▪ sand beaches are part of the biotic community and the MO should be retained.	The AHC retained this MO, with current and target levels as Information Needs. Camping beaches are a subset of all sand beaches, so the MOs may not be identical.
43	MO 34: Abundance target: range to be determined	The AHC changed this target to, "Information Need. No new non-native species. Invasive non-native species cover </= x% of total riparian area. Targets are species-specific."
44	MO 34: Distribution target: No new non-native species. Invasive non-native species cover ≤ x% of total riparian area.	The AHC changed this target to, "The target for distribution is no spreading of invasive non-native species to areas where they do not already occur."
	WATER	
	SEDIMENT	
45	"For the cultural goal, the purposes are plant habitat and preserving sites through <u>replenishing the terraces with alluvial sediment via alluvial or eolian transport.</u> filling in arroyos."	The AHC agreed to the following change for clarification: "… through filling in arroyos <u>and replenishing the terraces with sediment</u>."
46	MO 21: Why have this as an MO? This is an interim step, not an end in itself.	This is a necessary antecedent condition for BHBFs. Now we know that the sediment also comes from eddies. A large percentage of sand to build sandbars is at less than 8,000 cfs.
47	MO 21: Under current flows, the sand is moving out.	No response needed.
48	MO 21: Is sediment necessary for aquatic habitat?	Yes.
49	MO 21: Would this MO cause us to change flows?	Unlikely. Monthly volumes are determined by other criteria within the AOP.
50	MO 21: MA is to retain temporarily for beach building.	No response needed.
51	MO 21: Fine sediment also has a function in the ecosystem – habitat diversity (low flows, backwaters), substrate for benthic invertebrates.	Concur. See MO 8.2.
52	MO 21: Timing: can't keep flows less than 8,000. Specify timeframe in current and target levels.	Add to target, all attributes: "Including some timeframe based on tributary inputs and high flows timing (IN)."
53	Include other resources and uses, and other parameters, to be in the narrative: reach/scale variations, ability to store.	No response needed.
54	Correction to new MO 22: eddies up to ~~power plant capacity~~ 25,000 cfs.	This was done.

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55	Correction to new MO 23: shorelines between ~~power plant capacity~~ 25,000 cfs and maximum BHBF.	This was done.
56	MO 21A: Activity based on other purposes may negatively impact trout habitat in GLCA.	Concur. The MO specifies that "the target level should consider spawning habitat for trout in Glen Canyon."
57	PEP recommended attention be paid to coarse sediment.	Concur. There is an MO on rapids navigability that indirectly addresses debris flows, as well as an MO on trout spawning habitat.
	RECREATION	
58	9.1 Target: No more river-related deaths. Minimum flows 10,000 cfs. Make determination after LSSF at 8,000 cfs. Really shouldn't put a number in yet. Maximum flows 35,000 cfs. BHBF flows OK with adequate warning time (Stewart et al. 2000)	See comment 61.
58a	It appears that MO 4.1,4.2, and 10.3 are potentially at cross-purposes. I think the problem is using "Angler CPUE" as the target attribute in MO 10.3. CPUE is certainly a method to assess progress toward the objective, but to maintain or increase Angler CPUE while pursuing MO 4.1 (Abundance reduction) and 4.2 (Distribution restriction) (as well as, 2.6 – reduced predation) seems conflicted. The conflict may be resolved by changing the attribute and targets to "angler satisfaction level" or making sure the target Angler CPUE is sufficiently reduced from current levels to reflect the objective reductions in abundance and distribution at Lees Ferry and downstream.	Angler CPUE has been dropped in favor of an Information Need. Conflicts among MOs have not been fully vetted, but this one has been noted by the AHC.
59	MO 9.1 Information need - physical safety: also include data/conclusions from other reports re: accident rates during interim and experimental flows and BHBF. Brown and Hahn (1987) did the baseline study in 1985-6 for GCES I, and collected data at medium and high flows. Jalbert and Mitchell (1992) collected data in 90-91 during the "experimental flows" primarily at low flows, and Jalbert (1997) again in 1996 during the BHBF. Also Underhill and Borkan (1987). All these studies were done under GCES/GCMRC.	Concur. These will be added to 9.1 and 9.4.
60	MO 9.1 Safety target level. We need to explain/rationalize target level, which differs from the ROD. See Brown, 1987 and Jalbert, 1992, as well as Myers and Stewart et al.	See response under Comment 61.

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61	MO 9.1 was originally intended to focus on safety issues other than downstream navigation (wading anglers, upriver travel in Glen Canyon reach, trails to and along the river). Current level and target information for downriver navigation should be moved to MO 9.4.	New attribute for 9.4, Whitewater boating safety: Metric is river-related deaths or injuries. Qualitative target is to minimize river-related injuries and deaths. IN: To correlate flows, equipment type, and guide experience to NPS river incident reports, to determine flow-related risk. 9.1 Target: Metric is river-related deaths or injuries. Qualitative target is to minimize river-related injuries and deaths. IN: To correlate flows, equipment type, and guide experience to NPS river incident reports related to wading anglers, river travel in the flatwater reaches above the Paria River and below Separation Canyon, and trails to and along the river, to determine flow-related risk. The stage of Lake Mead should be included in the correlation for the reach below Separation Canyon.
62	MO 9.1 Delete citation from comments column.	The cite will not be listed twice.
63	MO 36 - Include ecosystem capacity to handle recreation impacts.	This is already in the comments column.
64	This may already be resolved but there are many versions of the MO documents and therefore, to be sure, we will repeat the comment. Under MO 36, the target should be consistent with the capacity of the Colorado River Ecosystem to sustain the recreation activity without harm to other resources. We expect this to be consistent with the Glen and Grand Canyon NPS Management Plans; however, the AMP MO should read as above and not reference these Plans as our targets.	Target levels for 9.1 and 9.2 now include no reference to NPS management plans. The note in the comments column says, “Target level should consider GLCA and GRCA management plans.”
65	9.2 Recreational Opportunity Spectrum: add definition to glossary, cite Manning. Somewhere you want to emphasize the regional ROS concept, possibly in the comments section. Although the parks will describe the ROS in respective plans, the GCDAMP goals should recognize that the "spectrum" of opportunities are available due to "year-round" flows; i.e. they include a temporal dimension as well as the physical dimension of opportunities ("wilderness" in winter vs. combat fishing in spring, etc.).	The element is now “recreational opportunities.”
66	9.2 Delete Myers citation from comment column.	Concur.
67	9.3, Distribution, Current level: 21 +/- 5 beaches per critical reach above 10,000 cfs 8,000 cfs?? capable of accommodating 16-36 people (after Kearsley et al. 1999)	Current level is now an Information Need.

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67a	MO 10.4 (now 9.3?): Understanding that GLCA and GRCA Management Plans are input to these targets, how do human-use induced increases in erosion rates, etc. in this MO match or conflict with the Sediment Goal and MO 23? Comments say "within the capacity of the CRE to absorb visitor impacts." As far as I know, this in itself is an Information Need. One of the purposes of BHBFs is to help restore sediment to terrace beaches. We do not know how much of the BHBF effort would be sacrificed due to recreational use.	See comment in 9.2.
68	9.3 Delete Myers citation from comment column.	Concur.
69	9.4: MO 9.1 was originally intended to focus on safety issues other than downstream navigation (wading anglers, upriver travel in Glen Canyon reach, trails to and along the river). Current level and target information for downriver navigation should be moved to MO 9.4.	See comment 61.
70	9.4 Information need: see citations above (Brown (1987) and Jalbert (1992). Delete Haberline citation from this MO (wrong citation).	Concur.
71	9.5 Include with information need: GRCA data on use levels and distribution. And under target level, you should reference GRCA management plans (in progress) similar to other MOs.	Concur.
72	9.5 Comment column: The NPS is probably responsible for monitoring this MO. Maybe until proven NPS is responsible for monitoring this MO.	This comment is now deleted.
73	9.5 Include citation for flow-related wilderness as described by Bishop, et al. (1986), previously referred to these as "Haberline..." (Haberline is associated with this group, but did not author the report): This study looked at the "willingness to pay.." for various flow levels and those attributes describing natural or wilderness values.	This has been added to the comments column.

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74	Additional References to be added to Bibliography: Bishop, Richard C., et al. 1986. Glen Canyon Dam Releases and Downstream Recreation: An Analysis of User Preferences and Economic Values. U.S. Bureau of Reclamation. Jalbert, Linda M. and Jerry M. Mitchell. 1992. The Influence of Discharge on Recreational Values Including Crowding and Congestion and Safety in Grand Canyon National Park. Grand Canyon National Park and Glen Canyon Environmental Studies. Jalbert, Linda M. 1997. The Effects of the Beach/Habitat Building Flows on Observed and Reported Boating Accidents on the Colorado River in Grand Canyon National Park. Grand Canyon National Park, AZ. Brown, Curtis A. and Martha G. Hahn. 1987. The Effects of Flows in the Colorado River on Reported and Observed Accidents in Grand Canyon. Grand Canyon National Park and U.S. Bureau of Reclamation. Underhill, A.H., M.H. Hoffman and R.E. Borkan. 1987. An Analysis of Recorded Colorado River Boating Accidents in Glen Canyon for 1980, 1982, 1984, and in Grand Canyon for 1981 through 1983. U.S. Bureau of Reclamation.	These will be included in the bibliography.
	ENERGY	
75	MO 40 used to be "maintain or increase." Is it now only "increase"?	Goal 11 changed to: "Maintain capacity and energy generation and increase where feasible and advisable, within the framework of GCDAMP."
76	Timeframe (for feasibility and advisability) by WAPA and notification TBD with AMWG.	Concur. Studies should be part of the AMP to ensure peer review.

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77	Concerns and responses about proposed financial criteria: ▪ What impact do financial criteria have on flows? ▪ How do we assess the impact of financial criteria on ecosystem goals? ▪ The financial criteria are important in dry years when purchases otherwise would be required. ▪ Financial exception criteria refer to only purchases. ▪ These ideas are subjugated to ecosystem goals. ▪ Would financial criteria involve changes to ROD? (Don't know.) ▪ Concern on impact on resources. Financial criteria need guidelines developed far in advance. ▪ Would this mean more exceedances? ▪ Burden of proof is on WAPA to demonstrate no negative impact.	These concerns will be the subject of the feasibility/advisability study.
78	Proposed new MOs to replace MO 40: 1. Maintain/increase marketable capacity and power at GCD constrained by the ROD/IN/IN. 2. Maintain existing emergency criteria for the WAPA system, constrained by the ROD/IN/IN. (current level equals target level) 3. Maintain emergency criteria for WSCC as constrained by the ROD. (current level equals target level) 4. Add financial criteria for WAPA system. The initial target is studies including feasibility, advisability, and impacts on other resources. Moving forward depends on impacts being nil or acceptable, and considering the need for ROD change and NEPA compliance. (How will the studies be funded? Some parts are already funded through AMP. WAPA might pay. Would this make a lot of money? Don't know how much.) 5. Add regulation for other systems. The initial target is studies including feasibility, advisability, and impacts on other resources. Moving forward depends on impacts being nil or acceptable, and considering the need for ROD change and NEPA compliance. (Discussion: ▪ Prefer this to be an IN, not an MO. ▪ Desired future condition - cost and operational effectiveness. ▪ Unclear what this means on everyday basis - this would come out in studies. Study should be within the program so we can have peer review and confidence.)	New MOs: 1. Maintain or increase / power / marketable capacity and energy / GCD / current practices / Information Need / constrained by the ROD. 2. Maintain / power / existing emergency criteria for the WAPA system / current practices / Information Need / constrained by the ROD. 3. Maintain / power / existing emergency criteria for WSCC system / current practices / Information Need / constrained by the ROD 4. Maintain / power / regulation / GCD / current practices / Information Need / Information Need: Determine if the current regulation scheme, or additional regulation schemes, will cause problems for the ecosystem. Adding regulation for other systems is now included in #4, above. Financial exception criteria are added to MO 12.5 on experimental flows, where the qualitative target is changed as indicated: "Target level is the experiments needed to gain critical understanding of ecosystem function under different dam operations<u>, e.g., BHBFs, HMFs, biological opinions flows, and financial exception criteria</u>."
	CULTURAL	
79	11.1 Current level: Information Need <u>29 sites have checkdams. 25% of the sites have visitor related impacts over ½ have been treated (i.e., trail obliteration) by NPS personnel.</u>	No response needed. Current level is "at least 264 properties."
80	MO 41 - Questions on APE & achieving 100% in the	APE legal definition will be included in the

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	target level.	Glossary, with a note that the PA signatories are re-evaluating the extent of the APE. The AHC felt that 100% is an optimistic goal, but one worthy of attempting. If a site is unable to be preserved in situ, the scientific information from it will be preserved.
81	41 - From the current level: At the meeting we had in October, we indicated that we should use 264 +/- archaeological sites; the number of TCPs was still unknown, but we knew we had at least one (the entire Grand Canyon as a TCP).	The current level is now "At least 264 properties."
82	Under MO 42, we wonder how does the AMP reconcile what appears to be a conflict between targets for this MO that seeks to preserve traditionally important resources and other MOs that recommend maintaining current resource conditions (NHWZ, marshes, trout, etc.)? Are the current resources now also traditionally important?	We want to preserve traditional resources, recognizing that some resources may vary in quantity as a result of management actions. For example, native tobacco abundance may fluctuate due to high flows.
83	42 - On some element should read "Traditionally important resources." On some attribute should read "Resource Integrity." Under from the current level -- I have notes that say "Information need obtained through ethnographic, social science research ..." To the target level should say "stable or improving." Comments should say "Purpose is to preserve, stabilize or improve, based on current cultural values, other traditionally important resources that are not being sufficiently addressed in other MO's."	The AHC made the following changes: Element: Traditionally important resources Attribute: Resource integrity Current: Information need (obtained through ethnographic studies, polls, interviews, surveys, and literature) Target: Long-term trend indicates stable or improving for each identified resource Comment: The target is to preserve (stabilize or improve based on current cultural values) traditionally important resources not sufficiently addressed under other MOs. Specifically, this MO addresses resources not considered Register-eligible.
84	43 - Under from the current level – We did not have $$ associated with this and I don't believe we should include them. We wrote "existing level (AMWG, TWG, PA)"	Current level is now: "Current participation at TWG, AMWG, and PA meetings."
85	45 - Under Perform some action, we had "Integrate and Synthesize." Under On some attribute, we had "interdisciplinary information"	The small group report was accepted with some changes: Integrate and synthesize/cultural and environmental data/interdisciplinary information/not readily available and not completely synthesized or integrated/readily accessible by georeferencing using GIS, databases, etc./Target is to ensure that data is able to be used both for increased understanding of the past and for ongoing interactions of humans within the CRE.
86	11.5 Action: Integrate We are the only ones that	This MO was moved to Goal 12.

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	mention this. Why wouldn't this just go generically with the next goal?	
87	MO 45 – New attribute proposed: "Increased understanding of the past and ongoing interaction of humans with the CRE."	This was later modified "interdisciplinary information."
	ADAPTIVE MANAGEMENT PROGRAM	
88	12.2 Action: Attain and maintain This should also include integration of all databases.	Concur. GCMRC is doing this already.
	GLOSSARY	
89	**AREA OF POTENTIAL EFFECT** Until additional studies are conducted, the APE definition should be the one in the EIS (256,000 cfs or the historic high water line).	The legal definition of APE will be included in the Glossary. However, this definition is being addressed in the course of development of the Historic Preservation Plan.